Dual Flat Block GeneAmp® PCR System 9700

User Guide

Applied Biosystems

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Preface

Safety information

Note: For general safety information, see this Preface and Appendix B, "Safety" on page 19. When a hazard symbol and hazard type appear by a chemical name or instrument hazard, see the "Safety" Appendix for the complete alert on the chemical or instrument.

Safety alert words

Four safety alert words appear in Applied Biosystems user documentation at points in the document where you need to be aware of relevant hazards. Each alert word—**IMPORTANT, CAUTION, WARNING, DANGER**—implies a particular level of observation or action, as defined below:

IMPORTANT! – Indicates information that is necessary for proper instrument operation, accurate chemistry kit use, or safe use of a chemical.

CAUTION! – Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

WARNING! – Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.

DANGER! – Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

Except for IMPORTANTs, each safety alert word in an Applied Biosystems document appears with an open triangle figure that contains a hazard symbol. *These hazard symbols are identical to the hazard symbols that are affixed to Applied Biosystems instruments* (see "Safety symbols" on page 20).

MSDSs

The MSDSs for any chemicals supplied by Applied Biosystems are available to you free 24 hours a day. For instructions on obtaining MSDSs, see "MSDSs" on page 26.

IMPORTANT! For the MSDSs of chemicals not distributed by Applied Biosystems, contact the chemical manufacturer.

Safety labels on instruments

The following CAUTION, WARNING, and DANGER statements may be displayed on Applied Biosystems instruments in combination with the safety symbols described in the preceding section.

Hazard symbol	English	Français
	CAUTION! Hazardous chemicals. Read the Material Safety Data Sheets (MSDSs) before handling.	**ATTENTION!** Produits chimiques dangereux. Lire les fiches techniques de sûreté de matériels avant toute manipulation de produits.
	CAUTION! Hazardous waste. Refer to MSDS(s) and local regulations for handling and disposal.	**ATTENTION!** Déchets dangereux. Lire les fiches techniques de sûreté de matériels et la régulation locale associées à la manipulation et l'élimination des déchets.
	CAUTION! Potential slipping hazard.	**ATTENTION!** Risque potentiel d'avoir un sol glissant.
	CAUTION! Hot surface.	**ATTENTION!** Surface brûlante.
	DANGER! High voltage.	**DANGER!** Haute tension.
	WARNING! To reduce the chance of electrical shock, do not remove covers that require tool access. No user-serviceable parts are inside. Refer servicing to Applied Biosystems qualified service personnel.	**AVERTISSEMENT!** Pour éviter les risques d'électrocution, ne pas retirer les capots dont l'ouverture nécessite l'utilisation d'outils. L'instrument ne contient aucune pièce réparable par l'utilisateur. Toute intervention doit être effectuée par le personnel de service qualifié venant de chez Applied Biosystems.
	CAUTION! Moving parts. Crush/pinch hazard.	**ATTENTION!** Pièces en mouvement, risque de pincement et/ou d'écrasement.

How to use this guide

Text conventions

This guide uses the following conventions:

- **Bold** text indicates user action. For example:

  Type **0**, then press **Enter** for each of the remaining fields.
- *Italic* text indicates new or important words and is also used for emphasis. For example:

  Before analyzing, *always* prepare fresh matrix.
- A right arrow symbol (▸) separates successive commands you select from a drop-down or shortcut menu. For example:

  Select **File ▸ Open ▸ Spot Set**.

  Right-click the sample row, then select **View Filter ▸ View All Runs**.

User attention words

Two user attention words appear in Applied Biosystems user documentation. Each word implies a particular level of observation or action as described below:

Note: – Provides information that may be of interest or help but is not critical to the use of the product.

IMPORTANT! – Provides information that is necessary for proper instrument operation, accurate chemistry kit use, or safe use of a chemical.

How to obtain support

For the latest services and support information for all locations, go to:

www.appliedbiosystems.com

At the Applied Biosystems web site, you can:

- Access worldwide telephone and fax numbers to contact Applied Biosystems Technical Support and Sales facilities.
- Search through frequently asked questions (FAQs).
- Submit a question directly to Technical Support.
- Order Applied Biosystems user documents, MSDSs, certificates of analysis, and other related documents.
- Download PDF documents.
- Obtain information about customer training.
- Download software updates and patches.

Dual Flat Block Sample Module

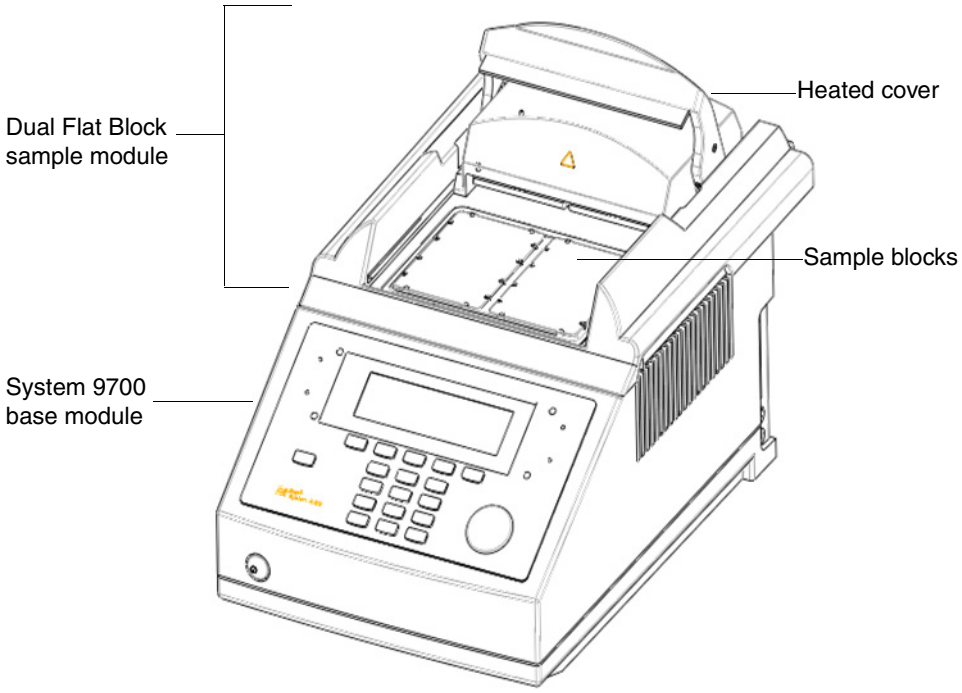
This chapter covers:

- About the Dual Flat Block sample module 2
- Instruments, accessories, and firmware. 3
- Install the Dual Flat Block sample module 4
- Thermal cycle the TaqMan® OpenArray® Genotyping Plates 5

About the Dual Flat Block sample module

The Dual Flat Block GeneAmp® PCR System 9700 amplifies nucleic acids using the polymerase chain reaction (PCR) process. The Dual Flat Block sample module attaches to the top of the GeneAmp® PCR System 9700 base module to run TaqMan® OpenArray® Genotyping Plates.

Instrument diagram



- **Sample blocks** – There are two sample blocks in the Dual Flat Block sample module. Each block holds up to four TaqMan® OpenArray® Genotyping Plates.
- **Heated cover** – The heated cover slides over the adaptor and compression pad. The cover holds the TaqMan OpenArray plates firmly and precisely on the sample blocks to ensure proper heat transfer.

Peltier heating/cooling unit

The internal Peltier heating/cooling unit is housed in the sample block module. The sample block module is made of aluminum to provide the optimal thermal transfer rate.

Platinum sensors in the sample block module provide:

- Wide temperature range: 4–99.9 °C
- Accuracy: ±0.25 °C from 35–100 °C
- Uniformity of each sample block: ±0.5 °C (measured after 30 seconds at 95 °C and 55 °C)
- Uniformity of combined sample blocks: ±0.75 °C (measured after 30 seconds at 95 °C and 55 °C)
- Long-term stability and high reliability

Instruments, accessories, and firmware

Instruments

You can purchase the GeneAmp® PCR System 9700 base module and the Dual Flat Block sample module together or separately.

Instrument	Applied Biosystems Part Number
Dual Flat Block GeneAmp® PCR System 9700	4428234
GeneAmp® PCR System 9700, Dual Flat Block sample module only	4425757
GeneAmp® PCR System 9700 base module	N805 0200

Accessories

The accessories listed below are included with the Dual Flat Block sample module. You can order replacements from Applied Biosystems.

Item	Quantity	Applied Biosystems Part Number
OpenArray® Adaptor for Dual Flat Block GeneAmp® PCR System 9700	1	4426824
OpenArray® Compression Pad for Dual Flat Block GeneAmp® PCR System 9700	1	4426825

Firmware

The GeneAmp® PCR System 9700 base module requires **9700 firmware v3.12 or later** to operate the Dual Flat Block sample module. See "Upgrade the firmware" on page 4.

IMPORTANT! If you do not upgrade the firmware to v3.12 or later, the Dual Flat Block sample module will be inoperable.

Install the Dual Flat Block sample module

Upgrade the firmware

The GeneAmp® PCR System 9700 base module requires **9700 firmware v3.12 or later** to operate the Dual Flat Block sample module. For instructions on upgrading the firmware:

- Refer to the *GeneAmp® PCR System 9700 Base Module User's Manual* (see "Related documentation" on page 31).

  Or

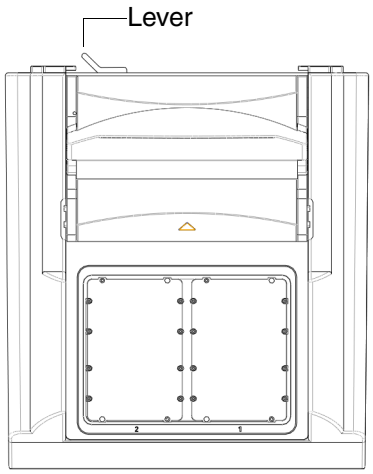
- Go to **www.appliedbiosystems.com/support**, select **Software Downloads, Patches and Updates**, then search under GeneAmp® PCR System 9700 for firmware updates.

IMPORTANT! If you do not upgrade the firmware to v3.12 or later, the Dual Flat Block sample module will be inoperable.

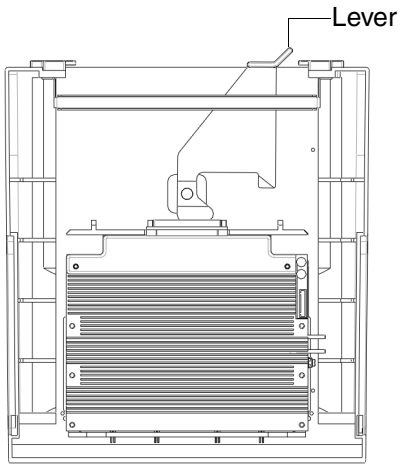
Install the module

To install the Dual Flat Block sample module into the GeneAmp® PCR System 9700 base module:

1. Pull the lever out from the Dual Flat Block sample module.



Top view, Dual Flat Block sample module



Bottom view, Dual Flat Block sample module

2. Place the Dual Flat Block sample module onto the base module, then push the Dual Flat Block sample module back to seat the electrical connections.

3. Push the lever into the base module to secure the Dual Flat Block sample module.

Note: If the Dual Flat Block sample module is not seated correctly, the instrument cannot be turned on.

Thermal cycle the TaqMan® OpenArray® Genotyping Plates

To thermal cycle the TaqMan OpenArray Genotyping plates:

- Prepare the plates (page 6)
- Insert the plates in the Dual Flat Block sample module (page 6)
- Perform thermal cycling (page 8)
- Remove the plates from the Dual Flat Block sample module (page 9)

WARNING! PHYSICAL INJURY HAZARD. During instrument operation, the temperature of the heated cover can be as high as 108 °C, and the temperature of the sample blocks can be as high as 100 °C. Before performing this procedure, wait until the heated cover and sample blocks reach room temperature.

Materials required

Item	Source	Part Number
OpenArray® Adaptor for Dual Flat Block GeneAmp® PCR System 9700	Applied Biosystems	4426824
OpenArray® Compression Pad for Dual Flat Block GeneAmp® PCR System 9700	Applied Biosystems	4426825
TaqMan® OpenArray® Genotyping Plates	Applied Biosystems	Various
70% Ethanol‡	Major Laboratory Suppliers (MLS)	—
Lint-free wipes	MLS	—

‡ For the MSDS of any chemical not distributed by Applied Biosystems, contact the chemical manufacturer. Before handling any chemicals, refer to the MSDS provided by the manufacturer, and observe all relevant precautions.

Prepare the plates

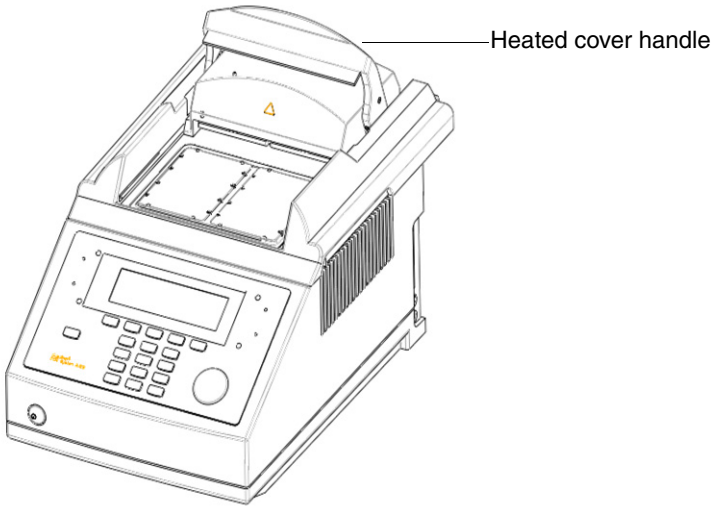
Prepare the TaqMan OpenArray plates according to the procedures in the *TaqMan® OpenArray® Genotyping System User Guide* (see "Related documentation" on page 31.

Guidelines for handling loaded plates

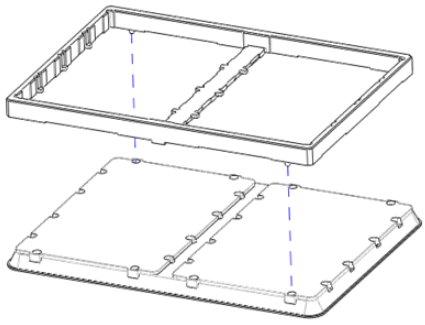
- Hold the TaqMan OpenArray plate by the edges, at the end opposite from the barcode. Do not touch the through-holes
- If you drop a loaded TaqMan OpenArray plate, discard it in the appropriate waste container.

Insert the plates

1. Pull up the heated cover handle, then slide the heated cover back.

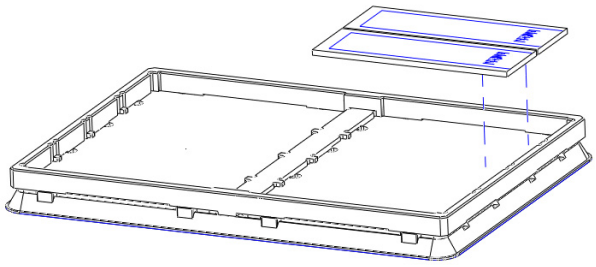


2. Position the adaptor:
   a. Insert the two adaptor pins into the circular slots on the module.
   b. Be sure the adaptor sits flat.



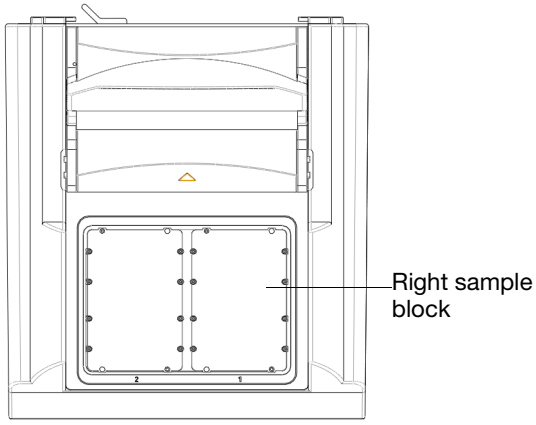
3. Position the TaqMan OpenArray plates:

   a. Orient each plate with the barcode facing up and along the edge of the block, away from the center of the adaptor.



   b. Insert the plates into the adaptor slots as follows:

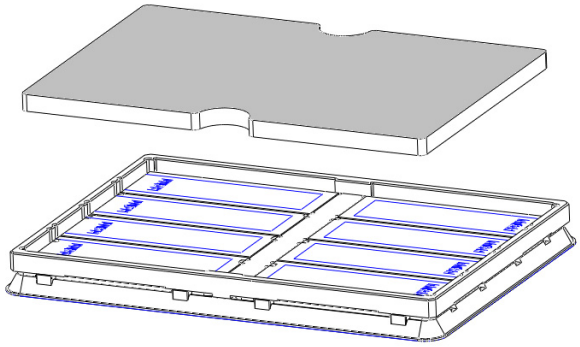
   - Fill up the **right** sample block first.



Note: The right sample block is the primary control block.

   - Fill up the center slots before any edge slots.
   - (Recommended) Insert unused TaqMan OpenArray plates into any empty slots.

4. Place the compression pad over the TaqMan OpenArray plates, with the Teflon coating (smooth side) facing upwards, away from the plates.



5. Slide the heated cover over the compression pad, then pull down the handle.

Perform thermal cycling

Use the touchpad on the GeneAmp® PCR System 9700 base module to program and start the thermal cycling run:

1. Press **F1** (RUN).
2. Press **F2** (VIEW) to view a list of run methods.
3. Select the OpenArray run method, then confirm the method is set as follows:

Stage	Step	Temp °C	Time (min:sec)	Ramp rate (%)	Reps
1. Pre-PCR hold	1	93.0	10:00	100	—
2. PCR cycles	1	95.0	00:45	84	50 cycles
	2	94.0	00:13	100	
	3	53.0	02:14	44	
3. Post-PCR hold	1	25.0	02:00	100	—

4. (Optional) Add a post-PCR overnight hold, as shown below.

Stage	Step	Temp °C	Time (min:sec)	Ramp rate (%)	Reps
4. Post-PCR overnight hold	1	4.0	9959	100	—

5. Press **F1** (START) to move to the next screen, then confirm the reaction volume is set to **5 µL**.
6. Press **F1** (START) to start the thermal-cycling run.

Remove the plates

1. Pull the heated cover handle up, then slide the heated cover back.
2. Remove the compression pad from the TaqMan OpenArray plates. To prevent the adaptor from moving the plates when you remove the compression pad, Applied Biosystems recommends the following:
   a. With your left hand, hold the adaptor at the bottom and top positions on the left side (place your thumb on the bottom and one or two fingers on the top of the adaptor; do not hold the adaptor at the corners).
   b. Place your right thumb into the bottom groove in the compression pad, then slowly peel the pad away from the TaqMan OpenArray plates.

   Note: Be careful when lifting the compression pad because some plates may stick to the pad.

3. Hold the adaptor at the top center position, then slowly lift it towards you. Use your other hand to hold down any plates that are lifted with the adaptor.
4. Wipe the plate surfaces with a lint-free wipe and 70% ethanol.

After thermal cycling, run the TaqMan OpenArray plates on the OpenArray® NT Imager according to the procedures in the *TaqMan® OpenArray® Genotyping System User Guide*.

Note: After thermal cycling, the TaqMan OpenArray plates can be stored at 4 °C, in the dark, for up to 72 hours.

Maintenance and Diagnostics A

This appendix covers:

- Clean the Dual Flat Block sample module 12
- Perform the temperature tests 14
- Perform the System Performance Diagnostics 14
- Schedule preventive maintenance 17

Clean the Dual Flat Block sample module

To clean the Dual Flat Block sample module:

- Clean the heated cover (page 13)
- Clean the sample blocks (page 13)

IMPORTANT! Before using any cleaning or decontamination method, except those recommended in this guide, check with Applied Biosystems to ensure that the proposed method will not damage the equipment.

⚠ **WARNING! PHYSICAL INJURY HAZARD.** During instrument operation, the temperature of the heated cover can be as high as 108 °C, and the temperature of the sample blocks can be as high as 100 °C. Before performing this procedure, wait until the heated cover and sample blocks reach room temperature.

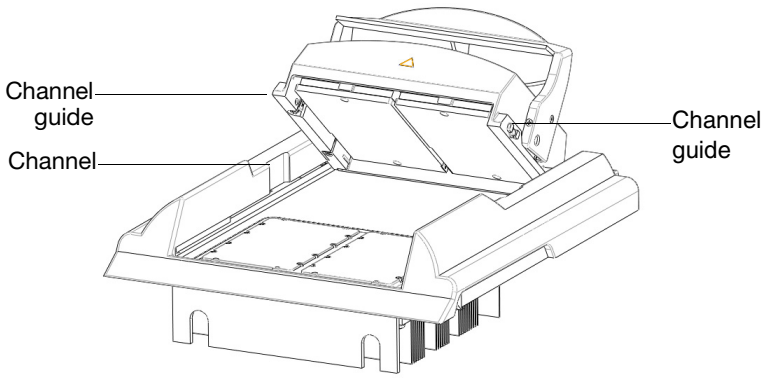
Materials required

Item	Source	Part Number
Lint-free wipes	Major Laboratory Suppliers (MLS)	—
Cotton swabs	MLS	—
Pure isopropanol‡	MLS	—
10% Bleach‡	MLS	—

‡ For the MSDS of any chemical not distributed by Applied Biosystems, contact the chemical manufacturer. Before handling any chemicals, refer to the MSDS provided by the manufacturer, and observe all relevant precautions.

Cleaning position

To clean the Dual Flat Block sample module, slide the heated cover back, then slide the protrusions on the lid up through the vertical slots in the module rails. The cleaning position is shown below.



Clean the heated cover

Clean the heated cover once a month or more frequently if needed.

1. Turn off the instrument, then wait 20 to 30 minutes for the instrument to cool down.
2. Raise the heated cover handle and slide the cover back almost, but not completely, to the back of its slide.
3. Line up the protrusions on the side of the heated cover with the vertical slots in the module rails.
4. Lift up the front of the heated cover until the protrusions travel up the vertical slots all the way to the top.
5. Soak a cotton swab or lint-free wipe with pure isopropanol and gently wipe the bottom of the cover.
6. Remove any remaining isopropanol from the cover and return the cover to its normal position.
7. If the cover becomes contaminated with amplified DNA:
   a. Raise the heated cover to the cleaning position.
   b. Wipe the cover with a lint-free wipe or cotton swab soaked in 10% bleach.
   c. Wipe with a damp lint-free wipe.

Clean the sample blocks

Clean the sample blocks once a month or more frequently if needed.

1. Turn off the instrument, then wait 20 to 30 minutes for the instrument to cool down.
2. Remove the compression pad, adaptor, and TaqMan® OpenArray® Genotyping Plates from the sample blocks.
3. Use a cotton swab soaked in pure isopropanol to clean the sample blocks thoroughly.
4. Remove any remaining isopropanol from the heated cover before using the instrument.
5. If the sample blocks become contaminated with amplified DNA:
   a. Clean the sample blocks thoroughly with a cotton swab soaked in 10% bleach.
   b. Wipe with a damp lint-free wipe.

Perform the temperature tests

The temperature tests for the Dual Flat Block sample module are the:

- **Temperature Verification Test** – This test determines the temperature accuracy of the Dual Flat Block sample module by measuring sample well temperatures at two set points, 45 °C and at 85 °C.
- **Temperature Non-Uniformity Test** – This test determines the temperature uniformity of the Dual Flat Block sample module by measuring the temperature at 8 well locations.

Applied Biosystems recommends that you perform the Temperature Verification and Temperature Non-Uniformity Tests once a year, or as required by your laboratory's standard operating procedures and protocols.

Procedures

For procedures on performing the temperature tests, refer to the *Multiprobe Temperature Verification Kit User Guide* (see "Related documentation" on page 31).

Perform the System Performance Diagnostics

The System Performance Diagnostics for the Dual Flat Block sample module are the:

- Rate Test (page 15)
- Cycle Test (page 16)

The System Performance Diagnostics verify the integrity of the cooling and heating system.

Applied Biosystems recommends that you perform the System Performance Diagnostics once a year, or as required by your laboratory's standard operating procedures and protocols.

Materials required

Item	Applied Biosystems Part Number
OpenArray® Adaptor for Dual Flat Block GeneAmp® PCR System 9700	4426824
OpenArray® Compression Pad for Dual Flat Block GeneAmp® PCR System 9700	4426825
TaqMan® OpenArray® Genotyping Plates	Various

Perform the Rate Test

Perform the Rate Test to verify that the Peltier units are operating correctly. The test takes approximately 2 minutes to run.

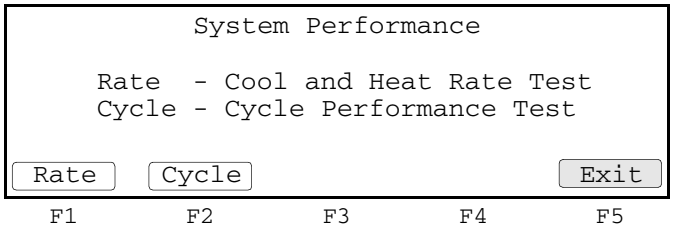
IMPORTANT! Ambient Temperature Conditions: Cool and Heat Rate tests provide accurate results only if the normal operating ambient temperature is 15 to 24°C.

To run the Rate Test:

1. Turn on the instrument. The main menu appears.
2. Press **Util** to open the Utilities screen.

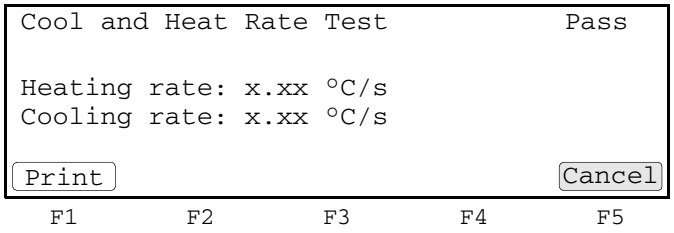
   Note: To press the menu items, use the corresponding F keys. For example, Util is F4 on this menu.

3. Press **Diag** to open the Diagnostics screen.
4. Press **System** to open the System Performance screen.



5. Press **Rate** from the System Performance screen, then install the adaptor and compression pad.
6. Slide the heated cover forward and pull the lever down.
7. Press **Cont**. The instrument runs through a series of tests in which the sample blocks are stabilized at 35 °C, 94 °C, and 4 °C.

When the test is completed, the Cool and Heat Rate Test screen appears. The screen displays the test results and whether the test passed or failed.



Passing ranges for the Rate Test are:

- Heating rate: > 1.0 °C/second
- Cooling rate: > –1.0 °C/second

If the test fails, contact Applied Biosystems Technical Support.

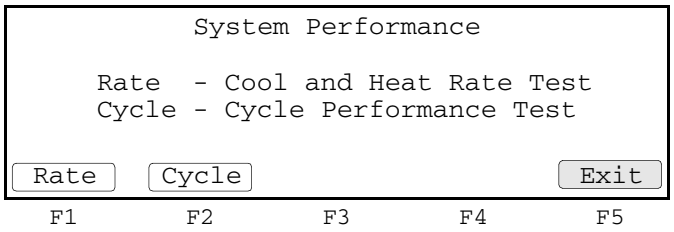
Perform the Cycle Test

Perform the Cycle Test to verify that the PCR cycling function operates properly. This test takes approximately 15 minutes to run.

1. Turn on the instrument. The main menu appears.
2. Press **Util** to open the Utilities screen.

   Note: To press the menu items, use the corresponding F keys. For example, Util is F4 on this menu.

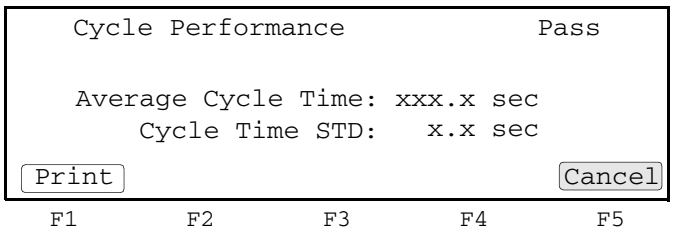
3. Press **Diag** to open the Diagnostics screen.
4. Press **System** to open the System Performance screen.



5. Press **Cycle** from the System Performance screen, then install the adaptor and compression pad.
6. Slide the heated cover forward and pull the lever down.
7. Press **Cont**. The Cycle Test executes a standard PCR cycling reaction, then measures and reports the average cycle time and the cycle-to-cycle variation.

   IMPORTANT! Do not press Pause during the Cycle Test as this may generate false test results. If you press Pause during the Cycle Test, re-run the test.

When the test is completed, the Cycle Performance screen appears. The screen displays the test results and whether the test passed or failed.



Passing ranges for the Cycle Test are:

- Average Cycle Time: ≤ 130 seconds
- Cycle Time STD: < 5 seconds

If the test fails, contact Applied Biosystems Technical Support.

Schedule preventive maintenance

To maintain system performance, Applied Biosystems recommends that the GeneAmp PCR System 9700 receives preventive maintenance by an authorized Applied Biosystems service representative or service facility.

Applied Biosystems recommends that you schedule preventive maintenance once a year, or as required by your laboratory's standard operating procedures and protocols.

Safety B

This appendix covers:

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  - Safety labels on instruments 21
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Instrumentation safety

Symbols on instruments

Electrical symbols on instruments

The following table describes the electrical symbols that may be displayed on Applied Biosystems instruments.

Symbol	Description
	Indicates the **On** position of the main power switch.
	Indicates the **Off** position of the main power switch.
	Indicates a standby switch by which the instrument is switched on to the **Standby** condition. Hazardous voltage may be present if this switch is on standby.
	Indicates the **On/Off** position of a push-push main power switch.
	Indicates a terminal that may be connected to the signal ground reference of another instrument. This is not a protected ground terminal.
	Indicates a protective grounding terminal that must be connected to earth ground before any other electrical connections are made to the instrument.
	Indicates a terminal that can receive or supply alternating current or voltage.
	Indicates a terminal that can receive or supply alternating or direct current or voltage.

Safety symbols

The following table describes the safety symbols that may be displayed on Applied Biosystems instruments. Each symbol may appear by itself or with text that explains the relevant hazard (see "Safety labels on instruments" on page 21). These safety symbols may also appear next to DANGERS, WARNINGS, and CAUTIONS that occur in the text of this and other product-support documents.

Symbol	Description
	Indicates that you should consult the manual for further information and to proceed with appropriate caution.
	Indicates the presence of an electrical shock hazard and to proceed with appropriate caution.
	Indicates the presence of a hot surface or other high-temperature hazard and to proceed with appropriate caution.

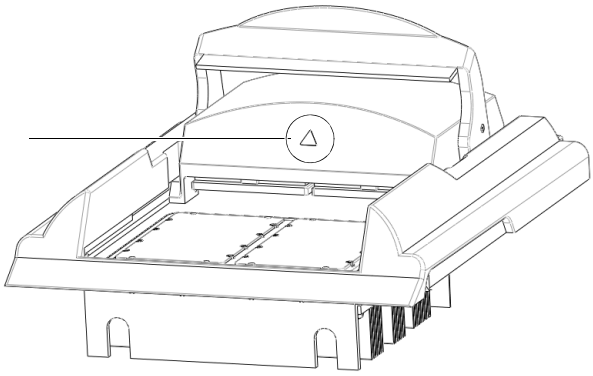
Environmental symbols on instruments

The following symbol applies to all Applied Biosystems electrical and electronic products placed on the European market after August 13, 2005.

Symbol	Description
	Do not dispose of this product as unsorted municipal waste. Follow local municipal waste ordinances for proper disposal provisions to reduce the environmental impact of waste electrical and electronic equipment (WEEE). **European Union customers:** Call your local Applied Biosystems Customer Service office for equipment pick-up and recycling. See **www.appliedbiosystems.com** for a list of customer service offices in the European Union.

Safety labels on instruments

The Dual Flat Block sample module contains a warning at the location shown below:



General instrument safety

WARNING! PHYSICAL INJURY HAZARD. Use this product only as specified in this document. Using this instrument in a manner not specified by Applied Biosystems may result in personal injury or damage to the instrument.

WARNING! PHYSICAL INJURY HAZARD. Using the instrument in a manner not specified by Applied Biosystems may result in personal injury or damage to the instrument.

Moving and lifting the instrument

CAUTION! PHYSICAL INJURY HAZARD. The instrument is to be moved and positioned only by the personnel or vendor specified in the applicable site preparation guide. If you decide to lift or move the instrument after it has been installed, do not attempt to lift or move the instrument without the assistance of others, the use of appropriate moving equipment, and proper lifting techniques. Improper lifting can cause painful and permanent back injury. Depending on the weight, moving or lifting an instrument may require two or more persons.

Operating the instrument

Ensure that anyone who operates the instrument has:

- Received instructions in both general safety practices for laboratories and specific safety practices for the instrument.
- Read and understood all applicable Material Safety Data Sheets (MSDSs). See "About MSDSs" on page 26.

Cleaning or decontaminating the instrument

CAUTION! Before using a cleaning or decontamination method other than those recommended by the manufacturer, verify with the manufacturer that the proposed method will not damage the equipment.

Physical hazard safety

Solvents and pressurized fluids

WARNING! PHYSICAL INJURY HAZARD. Always wear eye protection when working with solvents or any pressurized fluids.

Electrical safety

WARNING! ELECTRICAL SHOCK HAZARD. Severe electrical shock can result from operating the Dual Flat Block sample module without its instrument panels in place. Do not remove instrument panels. High-voltage contacts are exposed when instrument panels are removed from the instrument.

Fuses

WARNING! FIRE HAZARD. Improper fuses or high-voltage supply can damage the instrument wiring system and cause a fire. Before turning on the instrument, verify that the fuses are properly installed and that the instrument voltage matches the power supply in your laboratory.

WARNING! FIRE HAZARD. For continued protection against the risk of fire, replace fuses only with fuses of the type and rating specified for the instrument.

Power

WARNING! ELECTRICAL HAZARD. Grounding circuit continuity is required for the safe operation of equipment. Never operate equipment with the grounding conductor disconnected.

WARNING! ELECTRICAL HAZARD. Use properly configured and approved line cords for the voltage supply in your facility.

WARNING! ELECTRICAL HAZARD. Plug the system into a properly grounded receptacle with adequate current capacity.

Overvoltage rating

The Dual Flat Block sample module system has an installation (overvoltage) category of II, and is classified as portable equipment.

Safety and electromagnetic compatibility (EMC) standards

This section provides information on:

- U.S. and Canadian safety standards
- Canadian EMC standard
- European safety and EMC standards
- Australian EMC Standards

U.S. and Canadian safety standards

The Dual Flat Block sample module has been tested to and complies with standard:

UL 61010-1/CSA C22.2 No. 61010-1, "Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, Part 1: General Requirements."

UL 61010-2-010, "Particular Requirements for Laboratory Equipment for the Heating of Materials."

Canadian EMC standard

This instrument has been tested to and complies with ICES-001, Issue 3: "Industrial, Scientific, and Medical Radio Frequency Generators."

European safety and EMC standards

Safety

This instrument meets European requirements for safety (Low Voltage Directive 2006/95/EC). This instrument has been tested to and complies with standards EN 61010-1:2001, "Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use, Part 1: General Requirements."

EN 61010-2-010, "Particular Requirements for Laboratory Equipment for the Heating of Materials."

EN 61010-2-081, "Particular Requirements for Automatic and Semi-Automatic Laboratory Equipment for Analysis and Other Purposes."

EMC

This instrument meets European requirements for emission and immunity (EMC Directive 2004/108/EC). This instrument has been tested to and complies with standard EN 61326 (Group 1, Class B), "Electrical Equipment for Measurement, Control and Laboratory Use – EMC Requirements."

Australian EMC Standards

This instrument has been tested to and complies with standard AS/NZS 2064, "Limits and Methods Measurement of Electromagnetic Disturbance Characteristics of Industrial, Scientific, and Medical (ISM) Radio-frequency Equipment."

Chemical safety

General chemical safety

Chemical hazard warning

WARNING! CHEMICAL HAZARD. Before handling any chemicals, refer to the Material Safety Data Sheet (MSDS) provided by the manufacturer, and observe all relevant precautions.

WARNING! CHEMICAL HAZARD. All chemicals in the instrument, including liquid in the lines, are potentially hazardous. Always determine what chemicals have been used in the instrument before changing reagents or instrument components. Wear appropriate eyewear, protective clothing, and gloves when working on the instrument.

WARNING! CHEMICAL STORAGE HAZARD. Never collect or store waste in a glass container because of the risk of breaking or shattering. Reagent and waste bottles can crack and leak. Each waste bottle should be secured in a low-density polyethylene safety container with the cover fastened and the handles locked in the upright position. Wear appropriate eyewear, clothing, and gloves when handling reagent and waste bottles.

Chemical safety guidelines

To minimize the hazards of chemicals:

- Read and understand the Material Safety Data Sheets (MSDSs) provided by the chemical manufacturer before you store, handle, or work with any chemicals or hazardous materials. (See "About MSDSs" on page 26.)
- Minimize contact with chemicals. Wear appropriate personal protective equipment when handling chemicals (for example, safety glasses, gloves, or protective clothing). For additional safety guidelines, consult the MSDS.
- Minimize the inhalation of chemicals. Do not leave chemical containers open. Use only with adequate ventilation (for example, fume hood). For additional safety guidelines, consult the MSDS.
- Check regularly for chemical leaks or spills. If a leak or spill occurs, follow the manufacturer's cleanup procedures as recommended in the MSDS.
- Comply with all local, state/provincial, or national laws and regulations related to chemical storage, handling, and disposal.

MSDSs

About MSDSs

Chemical manufacturers supply current Material Safety Data Sheets (MSDSs) with shipments of hazardous chemicals to new customers. They also provide MSDSs with the first shipment of a hazardous chemical to a customer after an MSDS has been updated. MSDSs provide the safety information you need to store, handle, transport, and dispose of the chemicals safely.

Each time you receive a new MSDS packaged with a hazardous chemical, be sure to replace the appropriate MSDS in your files.

Obtaining MSDSs

The MSDS for any chemical supplied by Applied Biosystems is available to you free 24 hours a day. To obtain MSDSs:

1. Go to **www.appliedbiosystems.com**, click **Support**, then select **MSDS**.
2. In the Keyword Search field, enter the chemical name, product name, MSDS part number, or other information that appears in the MSDS of interest. Select the language of your choice, then click **Search**.
3. Find the document of interest, right-click the document title, then select any of the following:
   - **Open** – To view the document
   - **Print Target** – To print the document
   - **Save Target As** – To download a PDF version of the document to a destination that you choose

Note: For the MSDSs of chemicals not distributed by Applied Biosystems, contact the chemical manufacturer.

Chemical waste safety

Chemical waste hazards

CAUTION! HAZARDOUS WASTE. Refer to Material Safety Data Sheets and local regulations for handling and disposal.

WARNING! CHEMICAL WASTE HAZARD. Wastes produced by Applied Biosystems instruments are potentially hazardous and can cause injury, illness, or death.

WARNING! CHEMICAL STORAGE HAZARD. Never collect or store waste in a glass container because of the risk of breaking or shattering. Reagent and waste bottles can crack and leak. Each waste bottle should be secured in a low-density polyethylene safety container with the cover fastened and the handles locked in the upright position. Wear appropriate eyewear, clothing, and gloves when handling reagent and waste bottles.

Chemical waste safety guidelines

To minimize the hazards of chemical waste:

- Read and understand the Material Safety Data Sheets (MSDSs) provided by the manufacturers of the chemicals in the waste container before you store, handle, or dispose of chemical waste.
- Provide primary and secondary waste containers. (A primary waste container holds the immediate waste. A secondary container contains spills or leaks from the primary container. Both containers must be compatible with the waste material and meet federal, state, and local requirements for container storage.)
- Minimize contact with chemicals. Wear appropriate personal protective equipment when handling chemicals (for example, safety glasses, gloves, or protective clothing). For additional safety guidelines, consult the MSDS.
- Minimize the inhalation of chemicals. Do not leave chemical containers open. Use only with adequate ventilation (for example, fume hood). For additional safety guidelines, consult the MSDS.
- Handle chemical wastes in a fume hood.
- After emptying a waste container, seal it with the cap provided.
- Dispose of the contents of the waste tray and waste bottle in accordance with good laboratory practices and local, state/provincial, or national environmental and health regulations.

Waste disposal

If potentially hazardous waste is generated when you operate the instrument, you must:

- Characterize (by analysis if necessary) the waste generated by the particular applications, reagents, and substrates used in your laboratory.
- Ensure the health and safety of all personnel in your laboratory.

- Ensure that the instrument waste is stored, transferred, transported, and disposed of according to all local, state/provincial, and/or national regulations.

IMPORTANT! Radioactive or biohazardous materials may require special handling, and disposal limitations may apply.

Biological hazard safety

General biohazard

WARNING! BIOHAZARD. Biological samples such as tissues, body fluids, infectious agents, and blood of humans and other animals have the potential to transmit infectious diseases. Follow all applicable local, state/provincial, and/or national regulations. Wear appropriate protective equipment, which includes but is not limited to: protective eyewear, face shield, clothing/lab coat, and gloves. All work should be conducted in properly equipped facilities using the appropriate safety equipment (for example, physical containment devices). Individuals should be trained according to applicable regulatory and company/institution requirements before working with potentially infectious materials. Read and follow the applicable guidelines and/or regulatory requirements in the following:

- U.S. Department of Health and Human Services guidelines published in *Biosafety in Microbiological and Biomedical Laboratories* (stock no. 017-040-00547-4; **bmbl.od.nih.gov**)
- Occupational Safety and Health Standards, Bloodborne Pathogens (29 CFR§1910.1030; **www.access.gpo.gov/nara/cfr/waisidx_01/29cfr1910a_01.html**).
- Your company's/institution's Biosafety Program protocols for working with/handling potentially infectious materials.

Additional information about biohazard guidelines is available at:

www.cdc.gov

Safety alerts

For the definitions of the alert words **IMPORTANT**, **CAUTION**, **WARNING**, and **DANGER**, see "Safety alert words" on page v.

Chemical alerts

General alerts for all chemicals

For the MSDS of any chemical not distributed by Applied Biosystems, contact the chemical manufacturer. Before handling any chemicals, refer to the MSDS provided by the manufacturer, and observe all relevant precautions.

Instrumentation alerts

Specific instrumentation alerts

WARNING! PHYSICAL INJURY HAZARD. During instrument operation, the temperature of the heated cover can be as high as 108 °C, and the temperature of the sample blocks can be as high as 100 °C. Before performing this procedure, wait until the heated cover and sample blocks reach room temperature.

Documentation

Related documentation

To obtain this and additional documentation, see "How to obtain support" on page vii.

Document	Applied Biosystems part number
Dual Flat Block GeneAmp® PCR System 9700 User Guide	4426457
GeneAmp® PCR System 9700 Base Module User's Manual	4303481
Multiprobe Temperature Verification Kit User Guide	4376864
TaqMan® OpenArray® Genotyping System User Guide	4377476

Send us your comments

Applied Biosystems welcomes your comments and suggestions for improving its user documents. You can e-mail your comments to:

techpubs@appliedbiosystems.com

IMPORTANT! The e-mail address above is for submitting comments and suggestions relating *only* to documentation. To order documents, download PDF files, or for help with a technical question, see "How to obtain support" on page vii.

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